Block copolymer and composition comprising the same

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Abstract of **TW539688B**

Disclosed is a block copolymer comprising at least two S polymer blocks comprising vinyl aromatic hydrocarbon monomer units, and one B polymer block or two or more B polymer blocks which contains or collectively contain isoprene monomer units and 1,3-butadiene monomer units, wherein the amount of the vinyl aromatic hydrocarbon monomer units and the total amount of the isoprene monomer units and the 1,3-butadiene monomer units are, respectively, from 60 to 95% by weight and from 40 to 5% by weight, each based on the weight of the copolymer, wherein the isoprene monomer unit/1,3-butadiene monomer unit weight ratio is from 45/55 to 97/3, and wherein the vinyl aromatic hydrocarbon monomer unit moiety of the copolymer has a short segment ratio of from 0 to 30% by weight, which is defined as the weight percentage, based on the total weight of vinyl aromatic hydrocarbon monomer units in the copolymer, of the vinyl aromatic hydrocarbon monomer units in at least one short segment consisting of 1 to 3 vinyl aromatic hydrocarbon monomer units.

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BLOCK COPOLYMER AND COMPOSITION COMPRISING THE SAME

Abstract

Disclosed is a block copolymer comprising at least two S polymer blocks comprising vinyl aromatic hydrocarbon monomer units, and one B polymer block or two or more B polymer blocks which contains or collectively contain isoprene monomer units and 1,3-butadiene monomer units, wherein the amount of the vinyl aromatic hydrocarbon monomer units and the total amount of the isoprene monomer units and the 1,3-butadiene monomer units are, respectively, from 60 to 95 % by weight and from 40 to 5 % by weight, each based on the weight of the copolymer, wherein the isoprene monomer unit/1,3-butadiene monomer unit weight ratio is from 45/55 to 97/3, and wherein the vinyl aromatic hydrocarbon monomer unit moiety of the copolymer has a short segment ratio of from 0 to 30 % by weight, which is defined as the weight percentage, based on the total weight of vinyl aromatic hydrocarbon monomer units in the copolymer, of the vinyl aromatic hydrocarbon monomer units in at least one short segment consisting of 1 to 3 vinyl aromatic hydrocarbon monomer units.

Clams

1. A block copolymer comprising:
   (S) at least two polymer blocks, each comprising at least 70 % by weight of vinyl aromatic hydrocarbon monomer units, and
   (B) one or two more polymer blocks selected from the following polymer blocks (a), (b) and (c):
      (a) a polymer block comprising isoprene monomer units or comprising isoprene monomer units and vinyl aromatic hydrocarbon monomer units,
      (b) a polymer block comprising 1,3-butadiene monomer units or comprising 1,3-butadiene monomer units and vinyl hydrocarbon monomer units, and
      (c) a polymer block comprising isoprene monomer units and 1,3-butadiene monomer units or comprising isoprene monomer units, 1,3-butadiene monomer units and vinyl hydrocarbon monomer units,

   provided that the content of the vinyl hydrocarbon monomer units in each of said polymer blocks (a), (b) and (c) is less than 70 % by weight,
   wherein said one or two more B polymer blocks are comprised of one system selected from the group consisting of (B-1) to (B-5):
   (B-1) at least one polymer block (a) and at least one polymer block (b) in combination,
   (B-2) t least one polymer block (a) and at least one polymer block (c) in

combination,

(B-3) at least one polymer block (a), at least one polymer block (b) and at least one polymer block (c) in combination,

(B-4) at least one polymer block (b) and at least one polymer block (c) in combination, and

(B-5) at least one polymer block (c) alone,

the amount of the vinyl aromatic hydrocarbon monomer units in said block copolymer and the total amount of the isoprene monomer units and the 1,3-butadiene monomer units in said block copolymer being from 60 to 95 % by weight and from 40 to 5 % by weight, respectively, and the weight ratio of isoprene monomer unit to 1,3-butadiene monomer unit being from 45/55 to 97/3

wherein the vinyl aromatic hydrocarbon monomer unit moiety of said block copolymer has a short segment ratio of from 0 to 30 % by weight, wherein said short segment ratio is defined as the weight percentage, based on the total weight of vinyl aromatic hydrocarbon monomer units contained in said block copolymer, of the vinyl aromatic hydrocarbon monomer units contained in at least one short segment consisting of 1 to 3 vinyl aromatic hydrocarbon monomer units.

2. The block copolymer according to claim 1, wherein the polymer block (B) comprises (B-5) at least one polymer block (c) alone.

3. The block copolymer according to claim 1, wherein the polymer block (B) comprises (B-1) at least one polymer block (a) and at least one polymer block (b) in combination.

4. The block copolymer according to claim 1, wherein said isoprene monomer unit/1,3-butadiene monomer unit weight ratio is in the range of from 55/45 to 95/5.

5. The block copolymer according to claim 1, wherein said short segment ratio is in the range of from 1 to 25 % by weight.

6. The block copolymer according to claim 1, which is a linear block copolymer.

7. A block copolymer composition comprising 100 parts by weight of the block copolymer of any one of claims 1 to 6 and 0.05 to 3 parts by weight of at least one stabilizer which is selected from the group consisting of 2-(1-(2-hydroxy-3,5-di-t-pentylphenyl)ethyl)-4,6-di-t-pentylphenyl acrylate, 2-t-butyl-6-(3-t-butyl-2-hydroxy-5-methylbenzyl)-4-methylphenyl acrylate, and 2,4-bis((octylthio)methyl)-o-cresol.

8. A block copolymer/styrene resin composition comprising 10 to 99 % by weight of the block copolymer of any one of claims 1 to 6 and 90 to 1 % by weight of a styrene resin.

9. A block copolymer/styrene resin composition characterized in that said block copolymer/styrene resin composition comprises the block copolymer composition of claim 7 and a styrene resin, and the weight ratio of the block copolymer to said styrene resin is 10/90 to 99/1.